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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,212	08/02/2005	Kazuhiro Fukae	ACT-002	8443

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EXAMINER	
ARIANI, KADE	

ART UNIT	PAPER NUMBER
1651	

MAIL DATE	DELIVERY MODE
09/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,212	FUKAE, KAZUHIRO	
	Examiner	Art Unit	
	KADE ARIANI	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/19/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The amendment filed on 07/16/2009, has been received and entered.

New claims 13-20 have been canceled.

Claims 1-20 are pending in this application and were examined on their merits.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/16/2009 has been entered.

Answer to Arguments

Applicant's arguments with respect to claims 1-20 file don 07/16/2009 have been considered but are moot in view of the new ground(s) of rejection.

Declaration under 37 C.F.R. § 1.132

The declaration of Kazuhiro Fukae under 37 CFR 1.132 filed on 07/16/2009 is considered, but is moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The rejection of claims 1-12 under 35 U.S.C. 103(a) as being unpatentable over Inazu et al. (in IDS, Peptide Science 1998, M. Kondo Edition, p. 153-156) in view of Koketsu et al. (The journal of Food Science, 1993, Vol. 58, No. 4, p.743-747) and further in view of Yamamoto, K. (Journal of Bioscience and Bioengineering, 2001, Vol. 92, No. 6, p.493-501), and further in view of Narahashi et al. (Journal of Biochemistry, 1967, Vol. 62, No.6, Abstract), is withdrawn.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koketsu et al. (J. Carbohydrate Chemistry, 1995, Vol. 14, No.6, p.833-841) and SCORE search results, in view of Yamamoto et al. (JP 08099988 A, 1996, Abstract) and further in view of Inazu et al. (in IDS, Peptide Science 1998, M. Kondo Edition, p. 153-156) and Koketsu et al. (The journal of Food Science, 1993, Vol. 58, No. 4, p.743-747) and

Yamamoto, K. (Journal of Bioscience and Bioengineering, 2001, Vol. 92, No. 6, p.493-501).

Claims 1-13 are drawn to a process for preparing asparagine-linked oligosaccharide derivatives comprising the steps of (a) treating a delipidated egg yolk with orientase to obtain a mixture of peptide-linked oligosaccharides (b) treating the mixture of peptide-linked oligosaccharides with actinase to obtain a mixture of asparagine-linked oligosaccharides, (c) introducing a lipophilic protective group into the asparagine-linked oligosaccharides; and (d) subjecting the mixture of asparagine-linked oligosaccharide derivatives to a fractionating chromatography using a reverse phase column to separate the mixture into individual asparagine-linked oligosaccharide derivatives, delipidated egg yolk is obtained by delipidating an avian egg yolk with an organic solvent, wherein the asparagine-linked oligosaccharide derivatives are undeca- to penta-saccharide derivatives, wherein the asparagine-linked oligosaccharide derivatives are undeca- to hepta-saccharide derivatives, wherein the asparagine-linked oligosaccharide derivatives are undeca- to nona-saccharide derivatives, asparagine-linked oligosaccharide derivative is an undeca-saccharide derivatives, the lipophilic protective group is a carbonate-containing group, the lipophilic protective group is Fmoc group, wherein the asparagine-linked oligosaccharides contained in the mixture of asparagine-linked oligosaccharide derivatives obtained by step (b) are hydrolyzed before the subsequent step to cut off some sugar moieties, wherein the asparagine-linked oligosaccharides contained in the mixture of asparagine-linked oligosaccharide derivatives obtained in the mixture by step (c) are hydrolyzed before the subsequent

step to cut off some sugar moieties, and wherein the asparagine-linked oligosaccharide derivatives have the following formula (claim 13), wherein Prot is a lipophilic protective group, Asn is an asparagine, and Ac is an acetyl group.

Claims 14-20 are drawn a to a process for preparing asparagine-linked oligosaccharide derivatives comprising the steps of (a) treating a delipidated egg yolk with a protease (to obtain a mixture of peptide-linked oligosaccharides); (b) isolating the mixture of peptide-linked oligosaccharides; (c) treating the mixture of peptide-linked oligosaccharides with a peptidase (to obtain a mixture of asparagine-linked oligosaccharides); (d) introducing a lipophilic protective group into the asparagine-linked oligosaccharides in the mixture (to obtain a mixture of asparagine-linked oligosaccharides derivatives), the process further comprising (e) subjecting the mixture of asparagine-linked oligosaccharide derivatives to a fractionating chromatography using a reverse phase column (to separate the mixture into individual asparagine-linked oligosaccharide derivatives), wherein asparagine-linked undeca-saccharide derivatives, and asparagine-linked undeca-saccharide derivatives have the formula of claim 20.

Koketsu et al. (1995) teach a process for preparing asparagine-linked oligosaccharide derivatives comprising, treating a delipidated egg yolk with orientase (a protease) to obtain a mixture of peptide-linked oligosaccharides, isolating the mixture of peptide-linked oligosaccharides, an undeca-saccharide derivatives, and the asparagine-linked oligosaccharide derivatives structural formula (p.838 3rd paragraph lines 1-5, and Figure 3., see the SCORE structure search result). Koketsu et al. also teach purification by fractionating chromatography (Abstract and p.839 2nd paragraph).

Koketsu et al. do not teach treating the mixture of peptide-linked oligosaccharides with actinase, introducing a lipophilic protective group into the asparagine-linked oligosaccharides in the mixture, the lipophilic protective group is Fmoc group, and wherein the asparagine-linked oligosaccharide derivatives obtained are hydrolyzed before the subsequent step to cut off some sugar moieties.

However, Yamamoto et al. teach treating delipidated egg yolk with actinase E (a peptidase) (Abstract).

Inazu et al. teach a process for preparing asparagine-linked oligosaccharide derivatives, introducing a lipophilic protective group to the asparagine-linked oligosaccharides, and subjecting the mixture of asparagine-linked oligosaccharide derivatives to a fractionating chromatography using a reverse phase column to separate the mixture (p. 153, Abstract and p. 154, Figure 1. step 1, and p.156 1st paragraph lines 4-5).

Koketsu et al. (1993) teach egg yolk can be delipidated by treating with ethanol (organic solvent), and separating the mixture of oligosaccharides by reverse-phase column. Koketsu et al. also teach oligosaccharide derivatives can be obtained by hydrolyzing (cut off some sugar moieties), and obtaining an undeca saccharide derivative (Abstract, p.743 2nd column, 3rd paragraph, lines 1-2, p. 744, 2nd column 4th paragraph, lines 1-5, and p. 746, Figure 5, 3rd oligosaccharide derivative). Koketsu et al. further teach sialyloligosaccharides are being used to create drugs and food companies formulate functional foods by addition of sialyloligosaccharides. Koketsu et al. teach

chemical methods for preparation of sialyloligosaccharides are cumbersome and laborious (p.743 Introduction, 1st column 2nd paragraph).

Further motivation is in Yamamoto who teaches glycosylated peptide containing asparagine-linked oligosaccharide (N-acetylglucosaminyl peptide with an N-acetylglucosamine moiety bound to the asparaginyl residue of the peptide) have higher degree of resistance to protease digestion (Abstract). Yamamoto further teaches chemical synthesis of oligosaccharides are labor–intensive and involve complicated steps, on the other hand, enzymatic methods have the advantages because of their high stereo- and regio-selectivities (p. 493 Introduction 1st column, 1st paragraph).

Therefore, in view of the above teachings, a person of ordinary skill in the art at the time the invention was made, knowing that asparagine-linked oligosaccharide have higher degree of resistance to protease digestion and that chemical synthesis of oligosaccharides are labor–intensive and the advantages of enzymatic methods, would have been motivated to modify the process as taught by Koketsu et al. by using the peptidase enzyme actinase according to the teachings of Yamamoto et al., by introducing a lipophilic protective group (Fmoc) into the asparagine-linked oligosaccharide and by hydrolyzing the obtained asparagine-linked oligosaccharide according to teach teachings of Inazu et al. and Koketsu et al. (1993), in order to provide a process for preparing asparagine-linked oligosaccharide derivatives with a reasonable expectation of success, because Yamamoto et al. teach treating delipidated egg yolk with actinase E to extract useful oligosaccharides from delipidated egg yolk, because Inazu et al. teach lipophilic protective group (Fmoc) can be introduced to

asparagine-linked oligosaccharide to ease the purification, and because Koketsu et al. teach forming asparagine-linked oligosaccharide derivatives by hydrolyzing some sugar moieties.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kade Ariani whose telephone number is (571) 272-6083. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kade Ariani
Examiner
Art Unit 1651

/Leon B Lankford/
Primary Examiner, Art Unit 1651